**Table 4.1-3.** Estimated maximum incremental annual dose (millirem) to noninvolved worker from airborne releases.

| Fuel group | Technologies | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Prepare for direct co-disposal | Repackage and prepare to ship | Melt and dilute | Mechanical dilution | Vitrification technologies | Electrometallurgical treatment | Conventional processing[a] | Continued wet storage |
| A. Uranium and Thorium Metal Fuels | 0[b] | NA | $5.3\times10^{-4}$ | NA | $5.3\times10^{-4}$ | $5.3\times10^{-4}$ | $3.2\times10^{-4}$ | $1.8\times10^{-3}$[c] |
| B. Materials Test Reactor-Like Fuels | 0[b] | NA | 0.27 | 0.013 | 0.27 | 0.27 | 0.09 | 0.083[c] |
| C. HEU/LEU Oxides and Silicides Requiring Resizing or Special Packaging | 0[b] | NA | 0.085 | 0.0043 | 0.085 | 0.085 | 0.029 | 0.02[c] |
| D. Loose Uranium Oxide in Cans | NA | NA | $5.0\times10^{-3}$ | NA | $5.0\times10^{-3}$ | $5.0\times10^{-3}$ | $5.7\times10^{-3}$ | $4.7\times10^{-3}$[c] |
| E. Higher Actinide Targets | NA | 0[b] | NA | NA | NA | NA | NA | $6.7\times10^{-4}$[c] |
| F. Non-Aluminum-Clad Fuels | NA | 0[b] | NA | NA | NA | NA | NA | NA |

NA = Technology is not applicable to this fuel type.
HEU = Highly Enriched Uranium.
LEU = Low Enriched Uranium.

a. Annual impacts from Conventional Processing are lower because the amount of material processed annually by this technology is less than for other technologies. The annual impacts for Conventional Processing are based on operating one dissolver in a canyon. Impacts would double if the canyon was operated at full capacity (i.e., two dissolvers). Fuel processing of the entire SNF inventory would take over 20 dissolver-years using one dissolver and about 11 dissolver-years using two dissolvers. Processing all the fuel at full capacity in a new treatment facility would take about 7 years. Appendix E provides more information related to processing durations.

b. No incremental increase expected above SRS baseline radioactive emissions values reported in Chapter 3 because these options would not change the integrity of the fuel.

c. Reflects current reactor-area emissions (including two SNF wet basins).

**Table 4.1-4.** Estimated maximum incremental annual dose (millirem) to hypothetical maximally exposed offsite individual from airborne releases.

| | Technologies | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Fuel group | Prepare for direct co-disposal | Repackage and prepare to ship | Melt and dilute | Mechanical dilution | Vitrification technologies | Electrometallurgical treatment | Conventional processing[a] | Continued wet storage |
| A. Uranium and Thorium Metal Fuels | 0[b] | NA | $6.5\times10^{-5}$ | NA | $6.5\times10^{-5}$ | $6.5\times10^{-5}$ | $3.9\times10^{-5}$ | $2.6\times10^{-4}$[c] |
| B. Materials Test Reactor-Like Fuels | 0[b] | NA | 0.033 | 0.0016 | 0.033 | 0.033 | 0.011 | 0.012[c] |
| C. HEU/LEU Oxides and Silicides Requiring Resizing or Special Packaging | 0[b] | NA | 0.010 | $5.2\times10^{-4}$ | 0.010 | 0.010 | $3.5\times10^{-3}$ | $3.3\times10^{-3}$[c] |
| D. Loose Uranium Oxide in Cans | NA | NA | $6.1\times10^{-4}$ | NA | $6.1\times10^{-4}$ | $6.1\times10^{-4}$ | $7.0\times10^{-4}$ | $6.9\times10^{-4}$[c] |
| E. Higher Actinide Targets | NA | 0[b] | NA | NA | NA | NA | NA | $9.9\times10^{-5}$[c] |
| F. Non-Aluminum-Clad Fuels | NA | 0[b] | NA | NA | NA | NA | NA | NA |

NA = Technology is not applicable to this fuel type.
HEU = Highly Enriched Uranium.
LEU = Low Enriched Uranium.

a. Annual impacts from Conventional Processing are lower because the amount of material processed annually by this technology is less than for other technologies. The annual impacts for Conventional Processing are based on operating one dissolver in a canyon. Impacts would double if the canyon was operated at full capacity (i.e., two dissolvers). Fuel processing of the entire SNF inventory would take over 20 dissolver-years using one dissolver and about 11 dissolver-years using two dissolvers. Processing all the fuel at full capacity in a new treatment facility would take about 7 years. Appendix E provides more information related to processing durations.

b. No incremental increase expected above SRS baseline radioactive emissions values reported in Chapter 3 because these options would not change the integrity of the fuel.

c. Reflects current reactor-area emissions (including two SNF wet basins).

**Table 4.1-5.** Estimated maximum incremental annual dose (person-rem) to the 620,100 person population surrounding SRS from airborne releases.

| | Technologies | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Fuel group | Prepare for direct co-disposal | Repackage and prepare to ship | Melt and dilute | Mechanical dilution | Vitrification technologies | Electrometallurgical treatment | Conventional processing[a] | Continued wet storage |
| A. Uranium and Thorium Metal Fuels | 0[b] | NA | $2.4\times10^{-3}$ | NA | $2.4\times10^{-3}$ | $2.4\times10^{-3}$ | $1.4\times10^{-3}$ | $9.5\text{x}10^{-3}$[c] |
| B. Materials Test Reactor-Like Fuels | 0[b] | NA | 1.2 | 0.060 | 1.2 | 1.2 | 0.41 | 0.44[c] |
| C. HEU/LEU Oxides and Silicides Requiring Resizing or Special Packaging | 0[b] | NA | 0.38 | 0.019 | 0.38 | 0.38 | 0.13 | 0.12[c] |
| D. Loose Uranium Oxide in Cans | NA | NA | 0.022 | NA | 0.022 | 0.022 | 0.026 | 0.025[c] |
| E. Higher Actinide Targets | NA | 0[b] | NA | NA | NA | NA | NA | $3.57\text{x}10^{-3}$[c] |
| F. Non-Aluminum-Clad Fuels | NA | 0[b] | NA | NA | NA | NA | NA | NA |

NA = Technology is not applicable to this fuel type.
HEU = Highly Enriched Uranium.
LEU = Low Enriched Uranium.

a. Annual impacts from Conventional Processing are lower because the amount of material processed annually by this technology is less than for other technologies. The annual impacts for Conventional Processing are based on operating one dissolver in a canyon. Impacts would double if the canyon was operated at full capacity (i.e., two dissolvers). Fuel processing of the entire SNF inventory would take over 20 dissolver-years using one dissolver and about 11 dissolver-years using two dissolvers. Processing all the fuel at full capacity in a new treatment facility would take about 7 years. Appendix E provides more information related to processing durations.

b. No incremental increase expected above SRS baseline radioactive emissions values reported in Chapter 3 because these options would not change the integrity of the fuel.

c. Reflects current reactor-area emissions (including two SNF wet basins).